The Danish Dyslexia Test

Validity of a wide-range, web-based test for dyslexia

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The Danish National dyslexia test. Validity of a wide-range, web-based test for dyslexia

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Is dyslexia characterized by the same core phonological difficulty across all educational levels?

- The Danish Ministry of Education wanted a national procedure for determining whether students qualify as dyslexic,
- applicable to students from Grade 3 onwards.
- Problems to address:
  - Transitions: information did not follow the student.
  - Lack of standardized test at many levels.
  - Divergence definition of dyslexia.

Definition of dyslexia

"Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by ***difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities.*** *These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction."*

IDA, 2002

Core phonological decoding

Same operational definition at all levels

- Benefits
  - Simplify transitions for dyslexics.
  - Consistent operational definition of dyslexia makes dyslexia easier to understand for all.
- Challenge: Validity across levels
  - Concern that dyslexia manifests itself in different ways at different levels.
    - How persistent are phonological coding difficulties?

Questions addressed

- Applied wording
  - Is it possible to assess dyslexia reliably with a wide-range test across all educational levels?
- General insights wording
  - Are students who receive special support in reading characterized by the same phonological coding difficulties across all educational levels?

Criteria for external validation

- Fit with current provision of remedial teaching
  - Will the test score differentiate those who already receive support from those that do not?

- Fit with reading difficulties with actual course materials

Method - Participants

Participants from 10 different educational groups

Primary/secondary school

- Grade 3, 5, 7, 9

Upper secondary education

- Vocational education
- Technical/commercial upper secondary
- Upper secondary school

Higher education

- Short-cycle higher education (e.g. IT professional)
- Medium-cycle higher education (e.g. teacher, BSc engineering)
- Long-cycle higher education (e.g. biology, economics)

Method - Participants

Randomly sampled participants (total)	1264
Of which received special support in reading	78
Oversampled participants who received special support in reading	300
Total number of participants	1564

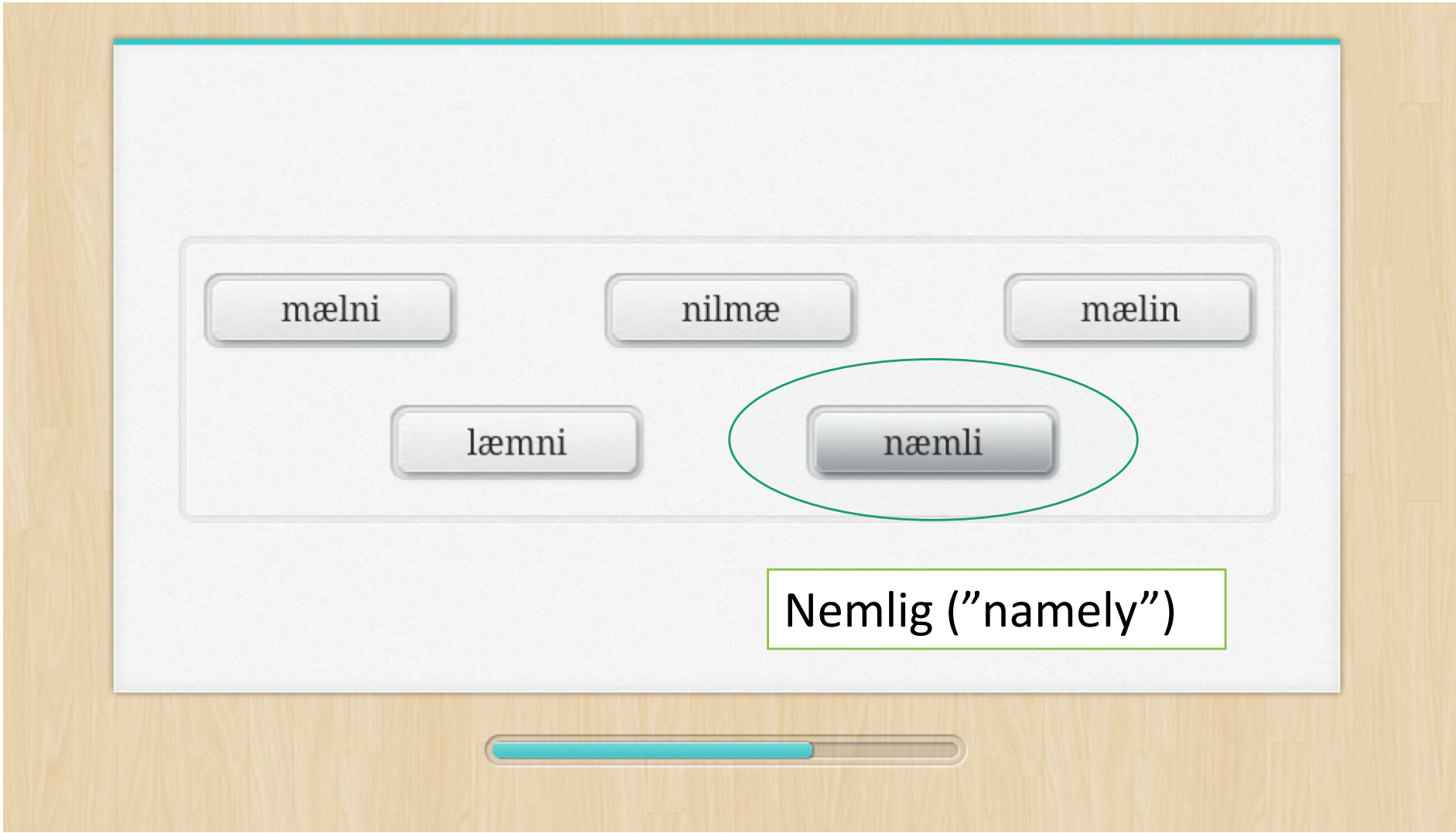
Procedure and measures

- The same computerized test for all.
- Self-explanatory (supervision is necessary).
- Two different tests of phonological coding.
- Time limited.

Non-word spelling
Find the appropriate spelling

Pseudo-homophone reading

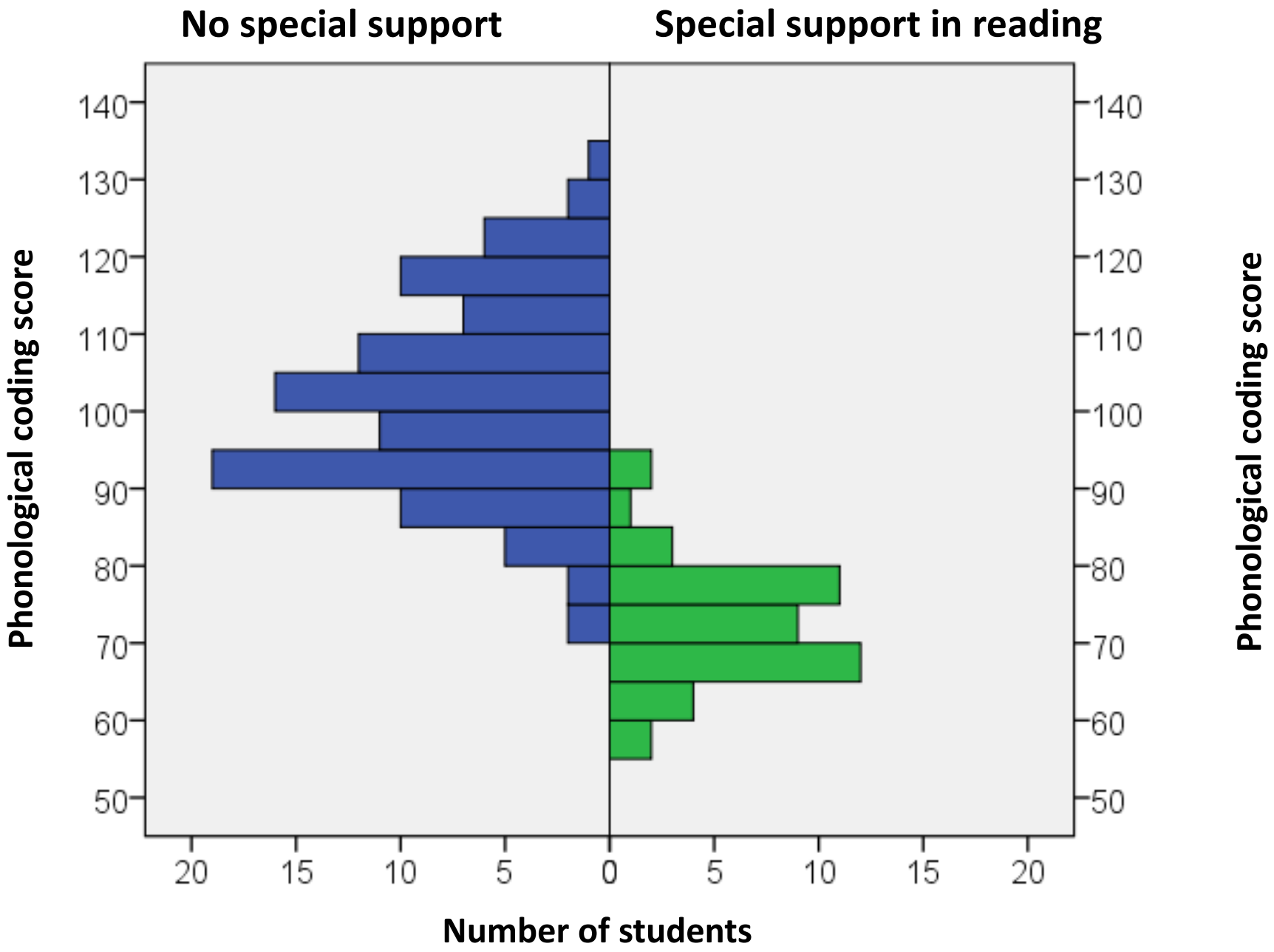
Find the non-word, that sounds like a real word



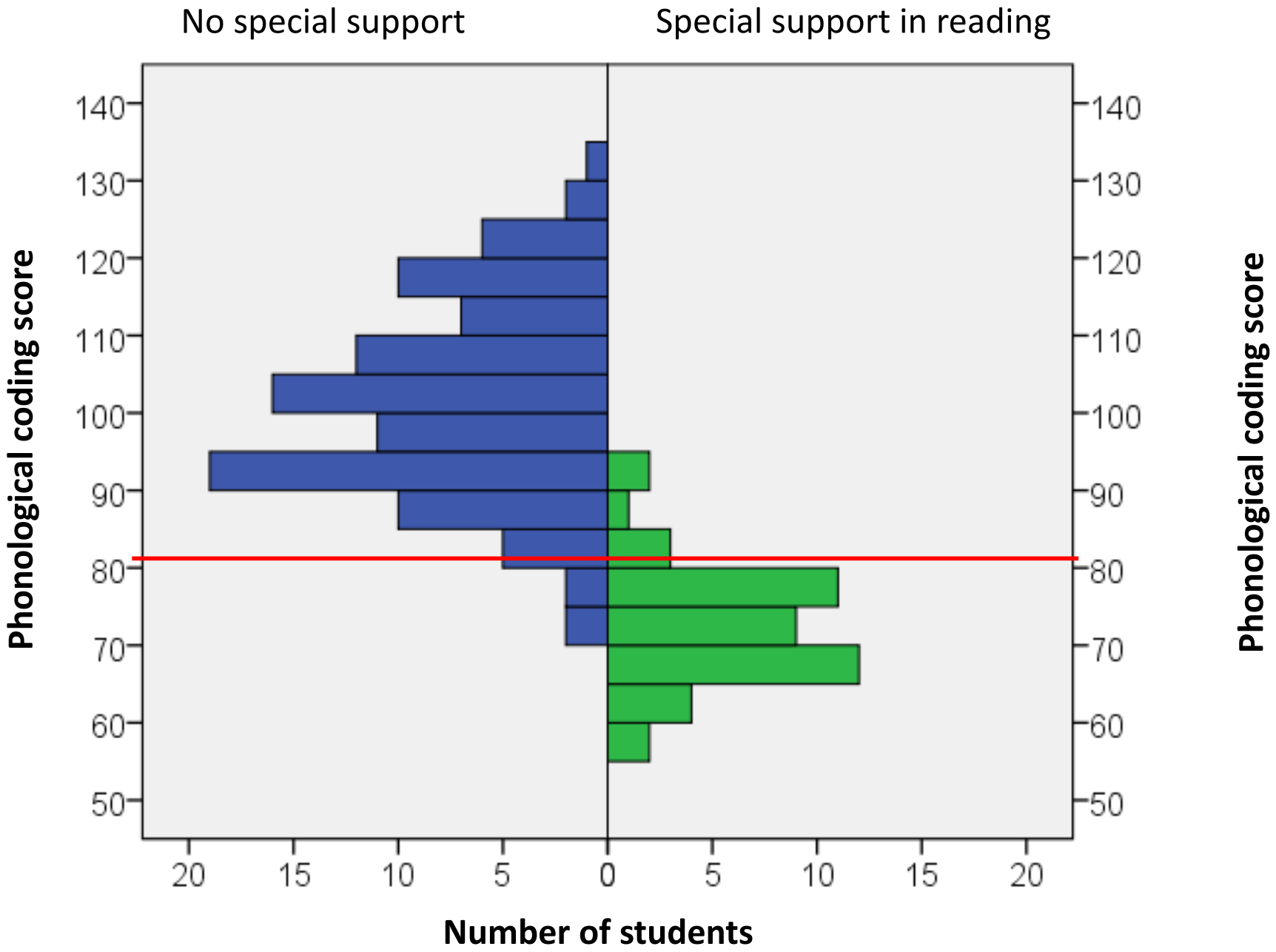
The Dyslexia Test score

- Scores from the two phonological coding tests:
  - Number of correct per minute.
  - Correction for wrong answers.
- The dyslexia test score:
  - Scaled: Grade 9 mean = 100 (SD = 15)
  - The mean of the two phonolocial coding scores.

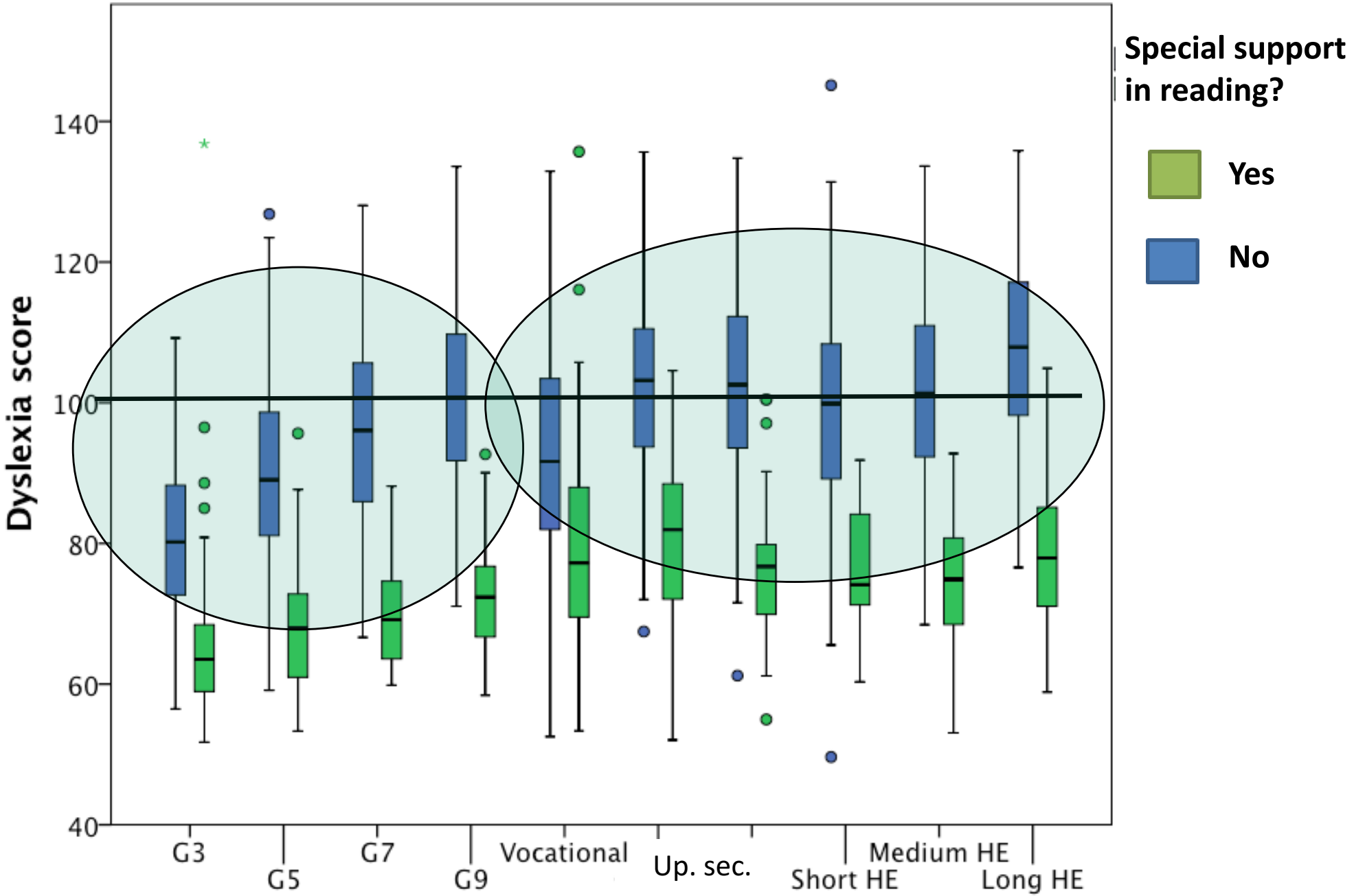
Results: Grade 9 (with oversampling)



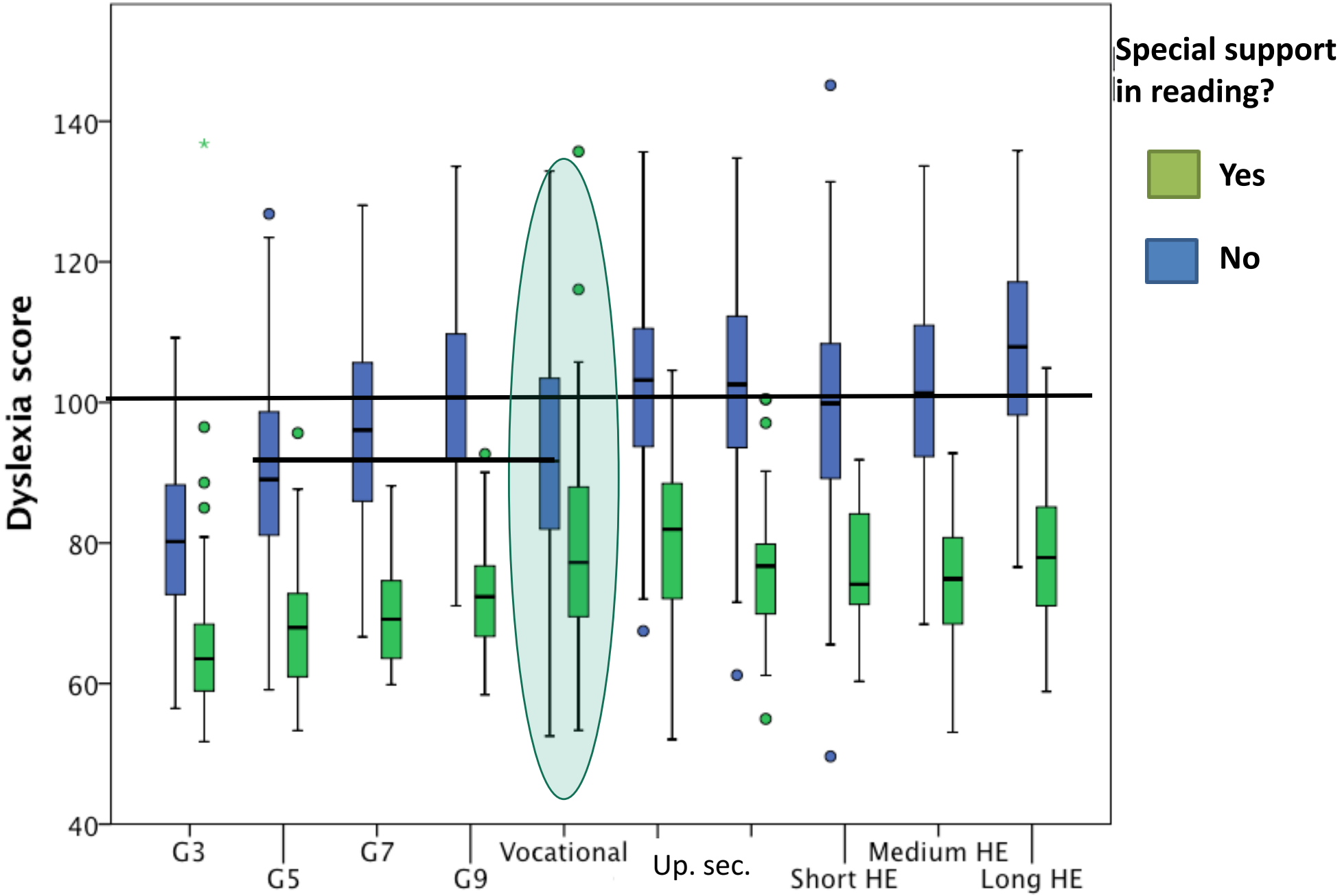
Results Grade 9 (with oversampling)



Results across educational levels (with oversampling)



Results across educational levels (with oversampling)



Validity and reliability across levels

Educational level	Area under the curve
G3	.85
G5	.93
G7	.97
G9	.97
Vocational	.75
Techincal upp sec	.89
Upper secondary	.94
Short-cycle HE	.90
Medium-cycle HE	.95
Long-cycle HE	.96

Is the dyslexia score relevant for educational outcome?

Follow-up study: Vocational students (basic commercial program)

- Correlation between dyslexia score and *comprehension* of written course materials:
  - r = .57
- All (except one) students qualifying as dyslexic had unsatisfactory comprehension of course material texts.

Conclusions

- A wide-range measure of decoding can be a valid marker of dyslexia across many educational levels.
  - The dyslexia scale differentiated between those who receive special support and those that did not.

- Dyslexia was characterized by the same decoding difficulties from G3 and up.
- This allows a simple definition of dyslexia, that is easy to explain.